ABSTRACT

A system and method of demodulating digital phase-modulated signals using zero-crossing detection at an appropriate intermediate frequency (IF). The input signal is filtered with an analog bandpass filter. The IF is chosen so that an appropriate linear digital filter applied to the output results in significantly improved Bit Error Rate (BER) of the recovered data signal. A microprocessor may be used to sample the incoming signal with its Timer Input. A Zero-Crossing-Detector detects the change of the sign of the signal with a one bit AD-converter. An effective low bit resolution, given by the timer frequency, is demanded. A resolution of only 2 to 5 bits for the time variation values of the zero-crossing intervals (spaces) δ is necessary for the digital filters to operate with high accuracy. The receiver can use either a linear or non-linear system model for its digital filter.